THE ASTROPHYSICAL JOURNAL

CONTENTS OF VOLUME 300, PART 1

1986 JANUARY 1, Number 1

	Page	Fiche
THE UNIVERSE BETWEEN $z = 10$ AND $z = 1000$: SPECTRAL CONSTRAINTS ON REHEATING — *Albert Stebbins and Joseph Silk*	1	1-A4
THE COSMIC-RAY SOURCE COMPOSITION — *Steven H. Margolis*	20	1-B12
PROPAGATION OF INJECTED COSMIC RAYS UNDER DISTRIBUTED REACCELERATION — *M. Simon, W. Heinrich, and K. D. Mathis*	32	1-C10
$^{148, 150}$Sm: A TEST FOR s-PROCESS NUCLEOSYNTHESIS — *R. R. Winters, F. Käppeler, K. Wisshak, A. Mengoni, and G. Reffo*	41	1-D5
THE EFFECT OF CLUSTERING OF GALAXIES ON THE STATISTICS OF GRAVITATIONAL LENSES — *Nels Anderson and Charles Alcock*	56	1-E9
THE STATISTICS OF GRAVITATIONAL LENSING. III. ASTROPHYSICAL CONSEQUENCES OF QUASAR LENSING — *Jeremiah P. Ostriker and Mario Vietri*	68	1-F4
MORPHOLOGICAL SEGREGATION IN THE PISCES-PERSEUS SUPERCLUSTER — *Riccardo Giovanelli, Martha P. Haynes, and Guido L. Chincarini*	77	1-F13
ORBITAL DECAY OF SATELLITE GALAXIES IN SPHERICAL SYSTEMS — *Martin D. Weinberg*	93	2-A4
DYNAMICAL INSTABILITIES IN SPHERICAL STELLAR SYSTEMS — *Joshua Barnes, Jeremy Goodman, and Piet Hut*	112	2-B12
STELLAR SPIRAL ARMS IN SMOOTH-ARMED GALAXIES — *Robert C. Kennicutt, Jr., and B. Kevin Edgar*	132	2-D12
NEUTRINO DIFFUSION IN STELLAR COLLAPSE — *L. J. van den Horn and J. Cooperstein*	142	2-E10
NEW EVIDENCE FOR GALAXY LUMINOSITY EVOLUTION — *M. J. Lebofsky and P. R. M. Eisenhardt*	151	2-F5
A SEARCH FOR THE SUNYAEV-ZEL'DOVICH EFFECT AT $\lambda = 3$ MILLIMETERS — *Simon J. E. Radford, Paul E. Boynton, Bobby L. Ulich, R. Bruce Partridge, Robert A. Schommer, Antony A. Stark, Robert W. Wilson, and Stephen S. Murray*	159	2-F13
ONE-PHOTON PAIR ANNIHILATION IN MAGNETIZED RELATIVISTIC PLASMAS — *Alice K. Harding*	167	2-G7
ELECTRON-POSITRON PAIR PRODUCTION BY ULTRARELATIVISTIC ELECTRONS IN A SOFT PHOTON FIELD — *Apostolos Mastichiadis, Alan P. Marscher, and Kenneth Brecher*	178	3-A4
A SURVEY OF NEUTRAL HYDROGEN ABSORPTION IN THE NUCLEI OF ACTIVE SPIRAL GALAXIES — *John M. Dickey*	190	3-B2
HOT SPOTS ON NEUTRON STARS. II. THE OBSERVER'S SKY — *Christ Ftaclas, Michael W. Kearney, and Kay Pechenik*	203	3-C3
CCD CAMERA BRIGHTNESS MONITORING OF Q0957+561A, B — *Rudolph E. Schild and Bryan Cholfin*	209	3-C9
THE ULTRAVIOLET EXCESS OF QUASARS. III. THE HIGHLY POLARIZED QUASARS PKS 0736+017 AND PKS 1510−089 — *Matthew A. Malkan and Richard L. Moore*	216	3-D3
COMPARATIVE STATISTICAL STUDY OF THE CHRONOMETRIC AND FRIEDMAN COSMOLOGIES BASED ON THE PALOMAR BRIGHT QUASAR AND OTHER COMPLETE QUASAR SURVEYS — *I. E. Segal and J. F. Nicoll*	224	3-D11
EFFECT OF SUSPENDED PARTICLES ON MAGNETOGRAVITATIONAL INSTABILITY OF A FINITELY CONDUCTING, ROTATING, HALL GAS-PARTICLE MEDIUM — *R. K. Chhajlani and P. Purohit*	242	3-F1
IDEAL CONDENSATIONS DUE TO PERPENDICULAR THERMAL CONDUCTION IN A SHEARED MAGNETIC FIELD — *G. Van Hoven, L. Sparks, and T. Tachi*	249	3-F8
METALLICITY DETERMINATIONS FOR GLOBULAR CLUSTERS THROUGH SPECTROPHOTOMETRY OF THEIR INTEGRATED LIGHT — *Jean P. Brodie and David A. Hanes*	258	3-G3

CONTENTS

	Page	Fiche
THE METALLICITY OF GLOBULAR CLUSTERS ASSOCIATED WITH THE GIANT ELLIPTICAL GALAXY NGC 4486 (M87) — *David A. Hanes and Jean P. Brodie*	279	4-B7
THE ABUNDANCE OF LITHIUM IN OLD GALACTIC CLUSTERS. I. NGC 7789 — *Catherine Pilachowski*	289	4-C4
HARD X-RAY OBSERVATIONS OF CYGNUS X-1 WITH THE MISO TELESCOPE — *F. Perotti, A. Della Ventura, G. Villa, L. Bassani, R. C. Butler, G. Di Cocco, R. E. Baker, A. J. Dean, and C. G. Hanson*	297	4-C12
A LIGHT SYNTHESIS PROGRAM FOR BINARY STARS. II. LIGHT CURVE AND COLOR CURVE EFFECTS IN A CONTACT SYSTEM — *Albert P. Linnell*	304	4-D5
ON THE NATURE OF THE DWARF CARBON STAR G77-61 — *D. S. P. Dearborn, James Liebert, Marc Aaronson, Conard C. Dahn, Robert Harrington, Jeremy Mould, and Jesse L. Greenstein*	314	4-E1
ABUNDANCES OF CARBON, NITROGEN, AND OXYGEN AND THEIR ISOTOPES IN THE ATMOSPHERES OF FOUR SC STARS — *James F. Dominy, George Wallerstein, and Nicholas B. Suntzeff*	325	4-E12
THE RELATION OF CHROMOSPHERIC ACTIVITY TO CONVECTION, ROTATION, AND PRE-MAIN-SEQUENCE EVOLUTION — *Ronald L. Gilliland*	339	4-F12
FREQUENCY ANALYSIS OF THE RAPIDLY OSCILLATING PECULIAR A STAR HD 60435 — *Jaymie M. Matthews, Donald W. Kurtz, and William H. Wehlau*	348	4-G7
X-RAY SPECTRA AND THE ROTATION-ACTIVITY CONNECTION OF RS CANUM VENATICORUM BINARIES — *P. Majer, J. H. M. M. Schmitt, L. Golub, F. R. Harnden, Jr., and R. Rosner*	360	5-A5
COMMENTS ON USING ABSOLUTE SPECTROPHOTOMETRY OF WOLF-RAYET STARS — *Anne B. Underhill*	374	5-B8
SPECTROSCOPIC STUDIES OF WOLF-RAYET STARS. III. THE WC SUBCLASS — *Ana V. Torres, Peter S. Conti, and Philip Massey*	379	5-B13
FAR-INFRARED OBSERVATIONS OF SAGITTARIUS B2: RECONSIDERATION OF SOURCE STRUCTURE — *Harley A. Thronson, Jr., and D. A. Harper*	396	5-D4
FAR-INFRARED CHARACTERISTICS OF K DWARFS WITH Hα EMISSION — *Hugh M. Johnson*	401	5-D9
AN INFRARED REFLECTION NEBULA SURROUNDING SGS 1 IN THE NGC 1333 DARK CLOUD — *Michael W. Castelaz, John A. Hackwell, Gary L. Grasdalen, and Robert D. Gehrz*	406	5-D14
CHEMISTRY OF CHLORINE IN DENSE INTERSTELLAR CLOUDS *Geoffrey A. Blake, V. G. Anicich, and W. T. Huntress, Jr.*	415	5-E9
THE ROLE OF NONCLASSICAL ELECTRON TRANSPORT IN THE LOWER SOLAR TRANSITION REGION — *Stanley P. Owocki and Richard C. Canfield*	420	5-E14
A COMPARISON OF PHOTOSPHERIC ELECTRIC CURRENT AND ULTRAVIOLET AND X-RAY EMISSION IN A SOLAR ACTIVE REGION — *Bernhard M. Haisch, Marilyn E. Bruner, M. J. Hagyard, and R. M. Bonnet*	428	5-F8
TWO-FREQUENCY IMAGING OF MICROWAVE IMPULSIVE FLARES NEAR THE SOLAR LIMB — *George A. Dulk, Timothy S. Bastian, and Sharad R. Kane*	438	5-G6
S v LINE RATIOS IN THE SUN — *P. L. Dufton, A. Hibbert, F. P. Keenan, A. E. Kingston, and G. A. Doschek*	448	6-A4
AN UPPER LIMIT TO X-RAY EMISSION FROM SATURN — *David A. Gilman, Kevin C. Hurley, Frederick D. Seward, Herbert W. Schnopper, James D. Sullivan, and Albert E. Metzger*	453	6-A9
PHOTOCHEMICAL HEATING OF COMETARY COMAE: THE EFFECT OF ICY WATER DROPLET RECONDENSATION — *W.-H. Ip*	456	6-A12
ERRATUM SHELL CROSSINGS AND THE TOLMAN MODEL — *Charles Hellaby and Kayll Lake*	461	6-B3
INSTRUCTIONS TO AUTHORS	i	6-B4

1986 JANUARY 15, Number 2

2.7 K RADIATION AND THE ISOTROPY OF THE UNIVERSE — *S. Bajtlik, R. Juszkiewicz, M. Prószyński, and P. Amsterdamski*	463	8-C1
HIGH-ENERGY AND ULTRA-HIGH-ENERGY COSMIC RAYS — *Carl E. Fichtel and John Linsley*	474	8-C12

CONTENTS

	Page	Fiche
SPECULATIONS ON THE FIZZLED COLLAPSE OF A MASSIVE STAR ... *Adam Burrows*	488	8-D12
BLACK HOLES AND LOCAL DARK MATTER ... *Dennis J. Hegyi, Edward W. Kolb, and K. A. Olive*	492	8-E2
I Zw 18 AND THE EXISTENCE OF VERY METAL POOR BLUE COMPACT DWARF GALAXIES *D. Kunth and W. L. W. Sargent*	496	8-E6
ENERGETIC RADIATION FROM RAPIDLY SPINNING PULSARS. I. OUTER MAGNETOSPHERE GAPS *K. S. Cheng, C. Ho, and M. Ruderman*	500	8-E10
ENERGETIC RADIATION FROM RAPIDLY SPINNING PULSARS. II. VELA AND CRAB *K. S. Cheng, C. Ho, and M. Ruderman*	522	8-G5
NULL TRANSITION TIMES, QUANTIZED DRIFT MODES, AND NO MEMORY ACROSS NULLS FOR PSR 1944+17 *W. T. S. Deich, J. M. Cordes, T. H. Hankins, and J. M. Rankin*	540	9-A10
AN ELLIPTICAL BINARY ORBIT MODEL OF GX 1+4 ... *Edwin P. Cutler, Brian R. Dennis, and Joseph F. Dolan*	551	9-B9
DENSITY CUSPS IN CLUSTERS OF GALAXIES ... *Timothy C. Beers and John L. Tonry*	557	9-B13
KNOTS, WIGGLES, AND FLARING IN BALLISTIC AND STOCHASTIC JETS ... *Dana Aaron Roberts*	568	9-D1
ON WIND-TYPE FLOWS IN ASTROPHYSICAL JETS. II. PROPAGATION OUTSIDE THE NUCLEUS AND THE CASE OF M87 ... *A. Ferrari, E. Trussoni, R. Rosner, and K. Tsinganos*	577	9-D10
A MODEL FOR THE SURFACE BRIGHTNESS OF A TURBULENT, LOW MACH NUMBER JET. II. THE GLOBAL ENERGY BUDGET AND RADIATIVE LOSSES ... *G. V. Bicknell*	591	9-E10
BEAM MODELS FOR RADIO SOURCES. V. COLLIMATION IN MORE REALISTIC GALACTIC POTENTIALS *Paul J. Wiita and M. Javad Siah*	605	9-F10
DDO 13: A LOW SURFACE BRIGHTNESS GALAXY WITH A WELL-FORMED H I DISK AND TWO TINY COMPANIONS ... *F. H. Briggs*	613	9-G4
Hα VELOCITY WIDTHS OF GIANT EXTRAGALACTIC H II REGIONS ... *Jean-René Roy, Robin Arsenault, and Gilles Joncas*	624	10-A2
HIGH-RESOLUTION IMAGING FROM MAUNA KEA: SURFACE PHOTOMETRY OF GALAXIES IN CL 0024+16 *Laird A. Thompson*	639	10-B3
IUE SPECTRA AND A RESULTING MODEL OF SEYFERT 2 GALAXIES ... *Gary J. Ferland and Donald E. Osterbrock*	658	10-D1
VELA OBSERVATIONS OF CENTAURUS A X-RAY ACTIVITY, 1969–1979 ... *James Terrell*	669	10-D12
THE CYGNUS LOOP: A DETAILED COMPARISON OF X-RAY AND OPTICAL EMISSION *J. Jeff Hester and Donald P. Cox*	675	10-E4
THE X-RAY SPECTRUM OF SN 1006 ... *A. J. S. Hamilton, C. L. Sarazin, and A. E. Szymkowiak*	698	10-F13
THE X-RAY SPECTRUM OF TYCHO ... *A. J. S. Hamilton, C. L. Sarazin, and A. E. Szymkowiak*	713	11-A1
IRAS 18333–2357: AN UNUSUAL SOURCE IN M22 ... *F. C. Gillett, G. Neugebauer, J. P. Emerson, and W. L. Rice*	722	11-A10
PRE-MAIN-SEQUENCE STARS IN THE SERPENS MOLECULAR CLOUD ... *E. Churchwell and J. Koornneef*	729	11-B4
HIGH ANGULAR RESOLUTION INFRARED MAPPING OF THE COMPACT H II REGIONS W51 AND DR 21/W75 *Paul M. Harvey, Marshall Joy, Daniel F. Lester, and Bruce A. Wilking*	737	11-C1
"STRÖMGREN REGION" ANALYSIS OF COMETARY H II REGIONS ... *A. C. Raga*	745	11-C9
THE DUST AND MOLECULAR GAS CLOUD SURROUNDING A PLANETARY NEBULA: NGC 7027 *Harley A. Thronson, Jr., and John Bally*	749	11-D1
SANDQVIST 187: A DENSE MOLECULAR CLOUD IN NORMA *H. Alvarez, L. Bronfman, R. Cohen, G. Garay, J. Graham, and P. Thaddeus*	756	11-D8
INTERSTELLAR MOLECULAR LINE SEARCHES AT 1.5 CENTIMETERS ... *Henry E. Matthews and Trevor J. Sears*	766	11-E9
THE CASE OF α CENTAURI: MASS, AGE, AND *p*-MODE OSCILLATION SPECTRUM *Pierre Demarque, D. B. Guenther, and William F. van Altena*	773	11-F3
NEW Hα EMISSION STARS FOUND ABOVE 10° GALACTIC LATITUDE ... *C. B. Stephenson*	779	11-F9

		Page	Fiche
V471 TAURI: A THREE-BODY ORBIT	*W. I. Beavers, T. J. Herczeg, and A. Lui*	785	11-G1
THE ORBIT OF GK PERSEI	*David Crampton, A. P. Cowley, and W. A. Fisher*	788	11-G4
THE SPECTRUM OF SS CYGNI DURING A DWARF NOVA ERUPTION	*Frederic V. Hessman*	794	11-G10
THE OPTICAL CONTINUA OF MAGNETIC VARIABLES	*Gary D. Schmidt, H. S. Stockman, and S. A. Grandi*	804	12-A6
X-RAYS FROM THE MAGNETIC WHITE DWARF PG 1658+441	*Steven H. Pravdo, Francis E. Marshall, Nick E. White, and Paolo Giommi*	819	12-B8
SOLAR ACTIVITY AND THE COUPLING OF *g*-MODE OSCILLATIONS	*Donat G. Wentzel*	824	12-B13
INTERPRETATION OF Hα CONTRAST PROFILES OF ACTIVE REGION LOOPS	*L. E. Cram*	830	12-C5
ERRATUM			
Hot Coronae around Early-Type Galaxies	*W. Forman, C. Jones, and W. Tucker*	836	12-C11
ABSTRACTS OF ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES, 1986 FEBRUARY ISSUE			
Radiative Acceleration of Astrophysical Jets: Line Locking in SS 433	*Paul R. Shapiro, Mordehai Milgrom, and Martin J. Rees*	837	12-E1
A Survey of the Millimeter-Wave Spectrum of Sagittarius B2	*Sally E. Cummins, R. A. Linke, and P. Thaddeus*	837	12-E1
Transformation Equations and Other Aids for *VRI* Photometry	*Benjamin J. Taylor*	838	12-E2
The Case Low-Dispersion Northern Sky Survey. III	*Peter Pesch and N. Sanduleak*	838	12-E2
Surface Photometry of Dwarf Elliptical Galaxies in the Virgo Cluster	*Shin-Ichi Ichikawa, Ken-Ichi Wakamatsu, and Sadanori Okamura*	838	12-E2
A Survey of Chromospherically Active Stars	*Francis C. Fekel, Thomas J. Moffett, and Gregory W. Henry*	839	12-E3
Photometry of Resolved Galaxies. V. NGC 6822	*J. G. Hoessel and Nels Anderson*	839	12-E3
INDEX TO VOLUME 300, PARTS 1 AND 2		i	8-B1

THE ASTROPHYSICAL JOURNAL LETTERS TO THE EDITOR

CONTENTS OF VOLUME 300, PART 2

1986 January 1, Number 1

		Page	Fiche
FORMATION OF ELLIPTICAL GALAXIES AND MASSIVE HALOS	*R. G. Carlberg, George Lake, and C. A. Norman*	L1	7-A4
A DOUBLE-LOBED RADIO GALAXY WITH SPIRAL STRUCTURE?	*S. M. Simkin and April Michel*	L5	7-A8
EPSILON AURIGAE: POLARIZATION, LIGHT CURVES, AND GEOMETRY OF THE 1982–1984 ECLIPSE	*J. C. Kemp, G. D. Henson, D. J. Kraus, I. S. Beardsley, L. C. Carroll, T. B. Ake, T. Simon, and G. W. Collins*	L11	7-B2
CIRCULAR POLARIZATION OF ASTROPHYSICAL MASERS DUE TO OVERLAP OF ZEEMAN COMPONENTS	*Shuji Deguchi and William D. Watson*	L15	7-B6
DETECTION OF INTERSTELLAR VIBRATIONALLY EXCITED HCN	*L. M. Ziurys and B. E. Turner*	L19	7-B10

1986 January 15, Number 2

1642+690: A SUPERLUMINAL QUASAR	*T. J. Pearson, P. D. Barthel, C. R. Lawrence, and A. C. S. Readhead*	L25	13-B1
STATISTICAL GRAVITATIONAL LENSING AND QUASAR-GALAXY ASSOCIATIONS	*P. Schneider*	L31	13-B6
ARE SUPERCLUSTERS CORRELATED ON A VERY LARGE SCALE?	*Neta A. Bahcall and William S. Burgett*	L35	13-B10
LIMB BRIGHTENING AND FILAMENTATION IN THE INNER RADIO JET OF CENTAURUS A	*David A. Clarke, Jack O. Burns, and Eric D. Feigelson*	L41	13-C1
A LOW-ENERGY JET EMANATING FROM THE GALACTIC NUCLEUS?	*F. Yusef-Zadeh, Mark Morris, O. B. Slee, and G. J. Nelson*	L47	13-C10
ON THE RELATIVE FREQUENCIES OF THE KINDS OF TYPE I SUPERNOVAE	*David Branch*	L51	13-D2
SUBLUMINOUS, RADIO EMITTING TYPE I SUPERNOVAE	*N. Panagia, R. A. Sramek, and K. W. Weiler*	L55	13-D6
X-RAY SPECTRAL OBSERVATIONS OF THE CRAB-LIKE SUPERNOVA REMNANTS G21.5−0.9 AND 3C 58	*J. Davelaar, A. Smith, and R. H. Becker*	L59	13-D10
EXOSAT OBSERVATIONS OF THE 35 DAY CYCLE OF HERCULES X-1: EVIDENCE FOR NEUTRON STAR PRECESSION	*J. Trümper, P. Kahabka, H. Ögelman, W. Pietsch, and W. Voges*	L63	13-E1
DO UV-BRIGHT STARS MIMIC NORMAL (POPULATION I) OB STARS?	*R. F. Garrison and C. E. Albert*	L69	13-E6
ON PUMPING ASTRONOMICAL MASERS	*Nikolaos D. Kylafis and Colin Norman*	L73	13-E11
NEW INTERSTELLAR MASERS IN NONMETASTABLE AMMONIA	*Suzanne C. Madden, William M. Irvine, Henry E. Matthews, Ronald D. Brown, and Peter D. Godfrey*	L79	13-F2
ENHANCEMENT OF CS IN THE HIGH-VELOCITY WING EMISSION IN NGC 2071	*Toshiaki Takano*	L85	13-F8
DETECTION OF CLUMP AND INTERCLUMP GAS IN THE ROSETTE MOLECULAR CLOUD COMPLEX	*Leo Blitz and Anthony A. Stark*	L89	13-F11
RAPID ACCELERATION OF ENERGETIC PARTICLES IN THE 1982 FEBRUARY 8 SOLAR FLARE	*S. R. Kane, E. L. Chupp, D. J. Forrest, G. H. Share, and E. Rieger*	L95	13-G2
PREDICTED SATELLITE PLASMA TORI IN THE MAGNETOSPHERE OF URANUS	*Aharon Eviatar and John D. Richardson*	L99	13-G6